

WHAT IS CLAIMED IS:

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1. A malleable shaft member for a surgical device having a tissue engaging means and a handle assembly, and an actuating means connecting the handle assembly and the tissue engaging means for actuating the tissue engaging means, the shaft member comprising:

5 a first tube made of a malleable material and having a proximal end, a distal end and a longitudinal axis, the proximal end of the first tube coupled to the handle assembly, the distal end of the first tube coupled to the tissue engaging means, the actuating means extending axially through the first tube, the first tube configured to
10 be kink resistant, fatigue resistant, and to bend about some bending radius in response to a bending moment applied to the first tube.

2. The shaft member of claim 1 wherein the bending moment applied to the first tube ranges between about 6 in-lbs to 27 in-lbs.

3. The shaft member of claim 1 wherein the bending moment applied to the
15 first tube ranges between about 12 in-lbs to 15 in-lbs.

4. The shaft member of claim 1, wherein the minimum bending radius of the first tube ranges from about $\frac{1}{4}$ inch to $\frac{3}{8}$ inch.

5. The shaft member of claim 1, wherein the first tube has a wall thickness and an outer radius extending from the longitudinal axis of the first tube to an outer
20 surface of the first tube, and wherein a ratio of the wall thickness to the square of the outer radius approximately ranges between about 2.0 and about 6.0.

6. The shaft member of claim 1, wherein the first tube is made of a material selected from the group consisting of stainless steel, copper, aluminum and brass.

7. The shaft member of claim 1, wherein the tube has a wall thickness ranging approximately between 0.008 inches and 0.050 inches and an outside diameter ranging approximately between 0.094 inches to 0.125 inches.

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C2 8. The shaft member of claim 1, wherein the proximal end of the first tube
5 is removably coupled to the handle assembly.

9. The shaft member of claim 1, wherein the distal end of the first tube is removably coupled to the tissue engaging means.

10. The shaft member of claim 1, further comprising a second tube, the first tube coaxially aligned and disposed within the second tube.

10 11. The shaft member of claim 10, wherein the second tube is made of a material selected from the group consisting of aluminum, brass, copper and plastic.

12. The shaft member of claim 10, wherein the first tube and the second tube are formed as a co-extrusion.

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C2 13. A surgical device comprising:
15 a tissue engaging means;
a handle assembly;
an actuating means connecting the handle assembly and the tissue engaging means for actuating the tissue engaging means; and
a shaft member made of a malleable material and having a proximal end,
20 a distal end and a longitudinal axis, the proximal end of the shaft member coupled to the handle assembly, the distal end of the shaft member coupled to the tissue engaging means, the actuating means extending axially through the shaft member, the shaft member configured to be kink resistant, fatigue resistant, and to bend about some bending radius in response to a bending moment applied to the shaft member.

14. ~~The surgical device of claim 13, wherein the bending moment applied to the shaft member ranges between 6 in-lbs to 27 in-lbs.~~

15. The surgical device of claim 13, wherein the bending moment applied to the shaft member ranges between 14 in-lbs to 15 in-lbs.

5 16. The surgical device of claim 13, wherein the shaft member has a wall thickness and an outer radius extending from the longitudinal axis of the shaft member to an outer surface of the shaft member, and wherein a ratio of the wall thickness to the square of the outer radius approximately ranges between 2.0 and 6.0.

10 17. The surgical device of claim 13, wherein the shaft member is made of a material selected from the group consisting of stainless steel, copper, aluminum and brass.

18. The surgical device of claim 13, wherein the proximal end of the shaft member is removably coupled to the handle assembly.

15 19. The surgical device of claim 13, wherein the distal end of the shaft member is removably coupled to the tissue engaging means.

20. The surgical device of claim 13, further comprising an outer tube, the shaft member coaxially aligned and disposed within the outer tube.

21. The surgical device of claim 20, wherein the outer tube is made of a material selected from the group consisting of aluminum, brass, copper and plastic.

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22. ~~A malleable shaft member for a surgical device having a tissue engaging means and a handle assembly, and an actuating means connecting the handle assembly and the tissue engaging means for actuating the tissue engaging means, the shaft member comprising:~~

a tube made of a malleable material and having a proximal end, a distal end and a longitudinal axis, the proximal end of the tube coupled to the handle assembly, the distal end of the tube coupled to the tissue engaging means, the tube configured to be kink resistant, fatigue resistant; and

5 at least one spring disposed within the tube, the actuating means extending axially through the spring and the tube for inhibiting the collapse of the tube.

23. The shaft member of claim 22, wherein the spring is a helical spring.

24. The shaft member of claim 22, wherein the at least one spring is a single helical spring extending from the proximal end of the tube to the distal end of the tube.

10 25. The shaft member of claim 22, wherein at least two springs are axially aligned and extend from the proximal end of the tube to the distal end of the tube.

26. The shaft member of claim 22, wherein the tube is made of a material selected from the group consisting of stainless steel, copper, aluminum and brass.

15 27. The shaft member of claim 22, wherein the proximal end of the tube is removably coupled to the handle assembly.

28. The shaft member of claim 22, wherein the distal end of the tube is removably coupled to the tissue engaging means.

20 29. A surgical device comprising:
a tissue engaging means;
a handle assembly;
an actuating means connecting the handle assembly and the tissue engaging means for actuating the tissue engaging means; and
a shaft member including:

a tube made of a malleable material and having a proximal end, a distal end and a longitudinal axis, the proximal end of the tube coupled to the handle assembly, the distal end of the tube coupled to the tissue engaging means, the tube configured to be kink resistant, fatigue resistant; and

5 at least one spring disposed within the tube, the actuating means extending axially through the spring and the tube.

30. The surgical device of claim 29, wherein the spring is a helical spring.

31. The surgical device of claim 29, wherein the at least one spring is a single helical spring extending from the proximal end of the tube to the distal end of the
10 tube.

32. The surgical device of claim 29, wherein the tube is made of a material selected from the group consisting of stainless steel, copper, aluminum and brass.

33. The surgical device of claim 29, wherein the proximal end of the tube is removably coupled to the handle assembly.

15 34. The surgical device of claim 29, wherein the distal end of the tube is removably coupled to the tissue engaging means.

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35. A malleable shaft member for a surgical device having a tissue engaging means and a handle assembly, and an actuating means connecting the handle assembly and the tissue engaging means for actuating the tissue engaging means, the shaft
20 member comprising:

an outer tube having a proximal end, a distal end and a longitudinal axis;
and

a inner tube made of a malleable material and having a proximal end, a distal end and a longitudinal axis, the proximal end of the inner tube coupled to the

25 handle assembly, the distal end of the inner tube coupled to the tissue engaging means,

the actuating means extending axially through the inner tube, the inner tube coaxially aligned and disposed within the outer tube, the inner tube configured to be kink resistant, fatigue resistant, and to bend about a bending radius in response to a bending moment applied to the inner tube.

5 36. The shaft member of claim 35, wherein the outer tube is made of a material selected from the group consisting of aluminum, brass, copper and plastic, and wherein the inner tube is made of a material selected from the group consisting of stainless steel, copper, aluminum and brass.

10 37. The shaft member of claim 35, wherein the proximal end of at least one of the inner tube and the outer tube is removably coupled to the handle assembly.

38. The shaft member of claim 35, wherein the distal end of at least one of the inner tube and the outer tube is removably coupled to the tissue engaging means.

39. The shaft member of claim 35, wherein the inner tube and the outer tube are formed as a co-extrusion.

40. A surgical device comprising:
a tissue engaging means;
a handle assembly;
an actuating means connecting the handle assembly and the tissue engaging means for actuating the tissue engaging means;
20 a shaft member made of a malleable material and having a proximal end, a distal end and a longitudinal axis, the proximal end of the shaft member coupled to the handle assembly, the distal end of the shaft member coupled to the tissue engaging means, the actuating means extending axially through the shaft member, the shaft member configured to be kink resistant, fatigue resistant, and to bend about a bending
25 radius in response to a bending moment applied to the shaft member; and

an outer tube having a proximal end, a distal end and a longitudinal axis,
the outer tube coaxially aligned with the shaft member, the shaft member disposed
within the outer tube.

41. The surgical device of claim 40, wherein the outer tube is made of a
5 material selected from the group consisting of aluminum, brass, copper and plastic, and
wherein the shaft member is made of a material selected from the group consisting of
stainless steel, copper and brass.

42. The surgical device of claim 40, wherein the proximal end of at least one
of the shaft member and the outer tube is removably coupled to the handle assembly.

10 43. The surgical device of claim 40, wherein the distal end of at least one of
the shaft member and the outer tube is removably coupled to the tissue engaging means.

44. The surgical device of claim 40, wherein the shaft member and the outer
tube are formed as a co-extrusion.

45. A shaft member for a surgical device having a tissue engaging means and
15 a handle assembly, and an actuating means connecting the handle assembly and the
tissue engaging means for actuating the tissue engaging means, the shaft member
comprising:

an elongate tubular member having a proximal end, a distal end, and an
inner matrix, the proximal end of the tube coupled to the handle assembly, the distal
20 end of the tube coupled to the tissue engaging means, the inner matrix defining a
plurality of longitudinally extending lumens, at least one lumen extending from the
proximal end to the distal end and configured to receive the actuating means, at least
one additional lumen configured to receive an elongate malleable support member.

46. The shaft member of claim 45, wherein the elongate tube is made of a
25 resilient material.

47. The shaft member of claim 46, wherein the plurality of lumens is five lumens and wherein a support member is disposed within four of the five lumens.

48. The shaft member of claim 45, wherein the support member is a metal cable.

5 49. A surgical device comprising:

a tissue engaging means;

a handle assembly;

an actuating means connecting the handle assembly and the tissue engaging means for actuating the tissue engaging means;

10 a shaft member having a proximal end, a distal end, and an inner matrix, the proximal end of the tube coupled to the handle assembly, the distal end of the tube coupled to the tissue engaging means, the inner matrix defining a plurality of longitudinally extending lumens, at least one lumen extending from the proximal end to the distal end and configured to receive the actuating means, at least one additional
15 lumen configured to receive an elongate malleable support member.

50. The surgical device of claim 49, wherein the shaft member is made of a resilient material.

51. The surgical device of claim 50, wherein the plurality of lumens is five lumens and wherein a support member is disposed within four of the five lumens.

20 52. The surgical device of claim 49, wherein the support member is a metal cable.